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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/924,698	08/08/2001	Toshihiro Yanagi	70904-56376	2439

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EXAMINER

LIU, MING HUN

ART UNIT	PAPER NUMBER
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2675

DATE MAILED: 03/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/924,698

Applicant(s)

YANAGI ET AL.

Examiner

Ming-Hun Liu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on ____ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2, 3 and 5.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1,3, 7, 8 and 10-13 are rejected under 35 U.S.C. 102(e) as being unpatentable by US Patent 6,522,319 to Yamazaki.

In reference to claim 1, Yamazaki discloses an active matrix display device with a charge-pump system power supply, and drivers (figure 1, items 2 and 3) for controlling the operations of the power supply (column 7, lines 30-42). The drivers have two operation modes including a scanning and a hold mode where no video signal is applied (column 10, lines 53-57). The display includes a mode switching means (figure 1, item 5) for periodically changing the modes, where the hold mode is equal or longer than the scanning mode (figure 3). Yamazaki also teaches a control means for switching according to the operation modes, in the frequency of the charge pump (figure 1, item 5; column 7, lines 39-42).

In reference to claim 3, Yamazaki teaches the use of an oscillator (figure 25, item 224) that generates a first clock signal used as a reference in the pump operation of the power supply in scanning mode (column 40, lines 48-65).

Referring to claim 7, it can be seen from figure 3 that Yamazaki teaches that the scanning mode and hold more ate repeated periodically with a period of several hundred msec.

As to claim 8, it can also be seen from figure 3, that Yamazaki teaches a display where the hold mode period is several ten times longer than the period of the scanning mode.

In reference to claim 10, Yamazaki discloses a display where the power consumption in the hold mode is significantly less than during the scanning mode (column 7, lines 60-67).

In reference to claim 11, it can be seen from figure 2 that Yamazaki teaches a power supply that multiplies the input voltage by a constant factor. He also discloses a second power supply that is also multiplied by another constant factor. It can be seen from figure 1, that the voltages generated in the drive voltage forming circuit are slaved to controller (item 5) and outputted to the driving means (items 2 and 3).

Claim 12 is rejected on grounds similar to the rejection of claim 11. Specifically, it can also be seen from figure 2 that Yamazaki also discloses a third power supply for inverting and raising the first power supply by a predetermined constant factor.

Claim 13 is rejected on grounds similar to the rejection of claim 1. It can be seen from figure 24 that Yamazaki includes the display on portable electrical devices.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki.

In reference to the first portion of claim 2, Yamazaki teaches a display device similar to the on being claimed where the operating current value is larger than the hold current value. Yamazaki however does not explicitly limit the fact that the operating current value and the hold mode differs by 10 times or more. However, on column 10, lines 65-67 Yamazaki teaches that the operation current during the hold period can be substantially reduced to about zero. As one skilled in the art understands, when taking a ratio of a value with zero, the ratio tends to approach high values, values exceeding 10. Therefore, even tough Yamazaki does not explicitly limit the operational currents, he understand the importance in maintaining minimal current value during the hold period. Again, the large differences (10 times or more) between the two current values are implied in Yamazaki's disclosure.

As for the second portion of the claim, Yamazaki teaches on column 7, lines 30-42 that the operation of the power supply is controlled so that it is functioning in optimum efficiency values. Furthermore the switching of the charge pump is based on the operational current values (column 10, lines 64-67). The purpose of the invention is to increase the efficiency of the charge pump. There is no disclosed criticality as to why the frequency must be assigned according to the maximum operational current.

In reference to claim 14, most of the claim is rejected on grounds similar to the rejection of claim 1, with the exception of the limitation of a smoothing capacitor. Yamazaki does not explicitly disclose the use of a smoothing capacitor, however it is well known in the art that

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charge pumps use capacitors and the inherent characteristic of capacitors are their smoothing effect.

Claim 15 is rejected on grounds similar to the rejection of claim 7.

5. Claims 4-6, 9 and 16-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Yamazaki and US patent 6,064,250 to Proebsting.

In reference to claims 4, 5 and 6 as mentioned before, Yamazaki teaches a display that is similar to with a power supply that includes a first clock signal.

However, Yamazaki fails to include a second clock signal that is used in the operation during the hold mode.

Proebsting in his parent teaches a charge pump that conserves power by variably varying the oscillation frequency during high voltage consumption and low voltage consumption periods (column 2, lines 38-52). Furthermore, Proebsting offers that the second clock signal is obtained through a divider (column 7, lines 40-57).

It would have been simple to added Proebsting's variable oscillating charge pump to Yamazaki's invention since Yamazaki's invention utilizes a charge pump and thus only simple substitution would be required.

It would have been obvious to one skilled in the art to added this variable oscillating charge pump, since it further improves power conservation and reduces current consumption during hold display periods.

In reference to claims 5 and 6, on column 6, line 53, Proebsting teaches that for the disclosed oscillating circuit, two separate oscillating circuits can be used. Furthermore, Proebsting outlines that the second clock signal be used during the hold mode, while the first is inactive (column 6, lines 50-53).

In reference to claim 9, the particular timing of the change in frequency of the charge pump is never explicitly stated Yamazaki. Proebsting, however suggests on column 7, line 59-67 that when the voltage mode is in preparation to switch the oscillating occur at higher frequencies to accommodate for the change.

In reference to claim 16, portions of the claim are rejected on grounds similar to the rejection of claim 8. As for the remaining section of the claim, Yamazaki and Proebsting never explicitly states that a drop margin of the output voltage when the pump operation is resumed is not more than 10% of an output voltage value to be maintained. However, Proebsting does disclose on column 7, line 66- column 8, line 6 that it is important to maintain a *smooth transition* between the different modes of operation. Even though Proebsting does not explicitly state the 10% requirement, the phrase smooth transition suggests that there must not be a large difference in the voltage level, certainly encompassing a transition of no more than a 10% difference.

In reference to claim 17, portions of the claim are rejected on grounds similar to the rejection of claims 7 and 8. As for the portion claiming a recovery time for an output voltage value during inactivity to return to a resumed operation within several ten μ sec, is a limitation that is inherent to the technology. Charge pumps function in fast ten μ secs level as switching elements function in nanosecond levels (column 21, line 21).

In reference to claim 18, portions of the claim are rejected on grounds similar to the rejection of claims 7 and 8. As for the portion limiting the operational current values during the different modes, there is no disclosed criticality as to why operational current during the hold more is not more than 0.01 of that in the scanning. It is understood from Proebsting's disclosure that there is a substantial difference between the operational currents of the two modes.

Claim 19 is rejected on grounds similar to the rejection of claim 8.

Claim 20 is rejected on grounds similar to the rejection of claim 9.

Claim 21 is rejected on grounds similar to the rejection of claim 10.

Claim 22 is rejected on grounds similar to the rejection of claim 11.

Claim 23 is rejected on grounds similar to the rejection of claim 12.

Claim 24 is rejected on grounds similar to the rejection of claims 13 and 14.

6. Claims 25-27, 29-31 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki in view of US Patent 5,977,940 to Akiyama.

Yamazaki teaches a display where power conservation is achieved where a hold mode is implemented. Although the specific method of image hold is different between Yamazaki and the applicant's claimed they nonetheless have their similarities as demonstrated above. Another hold method common to the art is implementing pixel memory methods as outlined by Akiyama. Pixel memory allows for power conservation and is an alternate hold mode method for displaying images that do not require high refresh rates (see Akiyama's abstract). With pixel memory the vertical scan period of a display would certainly be extended.

One skilled in the art would have used the pixel memory as a hold mode method to help conserve unnecessary expenditure of power in circuits.

7. Claims 23 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki in view of Proebsting and further in view of Akiyama.

The grounds of rejection for claims 23 and 28 are similar to the ones offered in the rejection of claims 25-27, 29-31 and 33. The difference in the arguments lies in the parent claim on which these two claims are dependent.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US Patent 6,456,267 to Sato et al. - Image memory for power conservation.

US Patent 5,471,225 to Parks: - Image memory for power conservation.

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ming-Hun Liu whose telephone number is 703-305-8488. The examiner can normally be reached on Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steve Saras can be reached on 703-305-9720. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ming-Hun Liu


DENNIS-DOON CHOW
PRIMARY EXAMINER